The use of straightwire technique and myofunctional therapy to treat anterior open bite due to tongue thrusting (case report)

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ABSTRACT

Background : *In contrast to the posterior teeth, which are still in occlusion, No incisal contact in the anterior part of the maxilla and mandibula between the vertical dimension is referred to as anterior open. Skeletal irregularity during the expansion of the intermaxillary gap and poor habits can both contribute to openbite. Tongue thrusting is one of the undesirable practices that might result in anterior openbite.*
Case*: A 19-year-old woman who protruded her tongue visited a dental office with the main complaint of an unattractive anterior open bite. She had an open bite of 12 12 21 22 dan 31 32 41 42, a Class II Division I subdivision Angle, a Class II skeletal relationship (protruding maxilla, retrusive mandibula, and bidental protrusive), an overjet of 6.87 mm, an overbite of 0.43 mm, and a Class II skeletal relationship*
Conclusion : *Straightwire method and myofunctional therapy are both effective treatments for anterior openbite repair brought on by tongue thrusting.*

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INTRODUCTION

A condition known as a "open bite" occurs when there is little to no vertical overlap between the mandibular and maxillary teeth.[1] Open bite can occur in dental, skeletal, and dentoskeletal. An anterior open bite typically has multiple contributing factors, including dental, soft tissue, and skeletal issues. Poor growth patterns, undesirable behaviors including finger sucking or tongue thrusting, increased lymphatic tissue, genetics, functioning oral matrix, and macroglossia are just a few possible etiological causes for an anterior open bite.[2] Location, origin, and extent of the open bite can all be used to classify and treat open bites. Based on the location, namely anterior and posterior open bite, while based on the structure involved, an open bite is divided into dental and skeletal open bite.

Patients with the anterior skeletal type of open bite, according to Bhalajhi (1997), exhibit the following traits: A steep mandibular plane angle, a large body, a small mandibular ramus, increased lower anterior facial height, decreased upper anterior facial height, increased anterior and decreased posterior facial height, and increased anterior and anterior facial height, tendency for a short upper lip with partially exposed maxillary incisor teeth, long and slender facial appearance. Due to their tendency to hold their tongues in a narrow position, patients often have proclinated maxillary anterior teeth, anterior teeth that do not overlap mandibular anterior teeth, and a thin maxillary arch. All of these describe the dental open bite. [3]

Numerous therapeutic techniques have been suggested for the correction of the anterior open bite because to the large variety of reasons. utilizing tools to break poor habits, bite blocks, therapy with high-pull headgear, molar intrusion, chin cup vertical pull, vertical elastic, multiloop edgewise archwire, temporary anchorage device, surgical repair, myofunctional therapy, or a combination of these are some of the therapies are among these. The main goal of myofunctional therapy is to improve muscle movement, restore proper swallowing patterns, balance appropriate labial-lingual postures, and get the tongue and lips in their resting positions. It consists of continuous maintenance techniques to strengthen and maintain muscle patterns. Once orthodontic treatment has begun, routine contouring is necessary to get the therapy's intended results. The patient's compliance will determine how long the treatment will take.[5]

CASE REPORT

The teeth felt advanced and bothered the patient cosmetically, while a 19-year-old lady complained of an open bite that made it difficult to smile. facial profile with a convex protrusion. An inspection of the study model revealed minor crowding and protruding upper and lower anterior teeth. Relationships between the class I right first molar, class II left first molar, and the class I and class II canines. Overbite -0.43 mm and overjet 5.46 mm. The maxilla is moved to the right 0.86 mm, causing an out-of-line relationship between the central inter-incisor line and the midline of the jaw.

Figure 1. Extra oral photographs before therapy

Figure 2. Intra oral photos before therapy

The cephalometric examination showed that the jaw relation was class II (ANB= 10°, protrusive maxilla (SNA=85°), while the mandible was retrusive (SNB=75°). The upper incisors were protrusive (I-NA=5 mm), inclination The upper incisors are proclined (angle I-NA=24°), the lower incisors are protrusive (I-NB=12 mm), the lower incisors are inclined (angle I-NB=41°). Angles FMPA and Go.Gn-Sn large Y-axis growth indicates more downward and backward growth of the mandible than normal, and a large Y-axis angle indicates greater vertical growth than horizontal mandibular growth. Soft tissue analysis shows protrusive upper and lower lips located further forward of the Steiner line. Analyst panoramic photo It can be seen that teeth 16,26,36 have been filled and teeth 46 have caries.

Figure 3. Cephalometric and OPG before treatment

The diagnosis in the patient was malocclusion Angle class II division I subdivision with skeletal class II relationship with protrusive maxillary and mandibular retrusion and protrusive bidental, overjet 5.46 mm and overbite -0.43 mm with malrelation in the form of anterior open bite and midline shifting of anterior jaw teeth up to the right 0.86 mm. Intraoral examination and x-ray showed fillings on teeth 16,26 and 36, caries on teeth 35, teeth 46 non-vital, and teeth 18, 28, 38, and 48 have not yet erupted. Relationship of Angle's class II left first molar and canine. overjet 6.87 mm and overbite -0.43 mm. There is a malrelation of anterior open bite between 12 12 21 22 and 31 32 41 42 and midline shifting anterior maxillary to the right 0.86 mm.

In this case, malocclusion class II division I subdivisiuon with class II skeletal relationships is caused by environmental and hereditary factors, based on the father's family history of advanced teeth. Anterior open bite is caused by a bad habit of tongue thrusting.

DISCUSSION

With myofunctional therapy, which aims to establish the proper resting position of the tongue, which is far from the teeth and is on the hard palate; to form the proper pattern of mouth, tongue, and facial muscles which can form the proper biting and eating patterns; to maintain the muscles of the mouth, tongue, and face to facilitate a good resting position of the tongue, lips, and jaw; the treatment given aims to improve the condition of crowded teeth. enhance nasal breathing patterns, reduce overbite and overjet, avoid relapse following orthodontic treatment, enhance the interaction between the jaws, foster a healthy oral environment for tooth growth, and eliminate lip incompetence or an open mouth posture.

It was determined to excise teeth 14 and 24 after planning the distribution of space with the use of dental model setup, arch determination computation, and cephalometric analysis. Because the patient was unwilling to receive root canal therapy, tooth 46 in the lower jaw was removed. Prior to starting orthodontic treatment, mandibular and maxillary scaling are performed.

The first step in the pre-treatment phase is muscular therapy education to break the negative habit of tongue pushing and instruction on healthy swallowing. The following are the stages of muscle therapy:

- First Week :
    - Day 1 : 6X Slurp-Swallow, Elastic lifter 1x per day

- Day 2,3 : 6X Slurp-Swallow 3x per day, Lifting elastic once daily (prolonged time)
- Day 4-7 : 12X Slurp-Swallow, Lifting elastic once daily (prolonged time)

- Second Week :
  3x per day :
  - 6X Slurp-Swallow,
  - 3X tongue clicks,
  - 12X ch-ch-ch (first 2 days), 12 ch-ch-slurp swallow (days after),
  - Lip strenghtening using card between lips 1x per day with increased intensity
- Third Week :
  3x per day :
  - 6 Ch-Ch-Slurp-Swallow,
  - 3 Tongue clicks,
  - 12 Tongue kicks,
  - Eat biscuit (first 2 days), eat full meal 1x per day with correct swallowing (days after)
- Fourth Week :
  - Eat 3x per day with correct swallowing
  - Drink plain water with correct swallowing (first day), drink all drinks with correct swallowing (days after)
  - Gargling when rinsing
- Fifth Week :
  - Eat all meal with correct swallowing
  - Drink all drinks with correct swallowing
  - Drink 2 glasses with fast drinking everyday
  - Gargling when rinsing
- Sixth Week :
  - Able to eat with correct swallowing
  - Eat 1x per day with lips positioned backward
  - Mouth closed
  - 5 swallows before bedtime
  - Check closed lip position when sleeping

After 16 months of treatment with the Straightwire fixed orthodontic appliance and myofunctional muscle therapy, showed correction of the anterior open bite to 3.78 mm overjet and 3.16 mm overbite, and improvement in tongue-thrusting habits and formation of better swallowing patterns. This change occurred due to the installation of a bracket position that was more occlusal on the posterior teeth and more gingival on the anterior teeth, thus allowing intrusion of the posterior teeth and extrusion of the anterior teeth, as well as anterior retraction which caused overjet and overbite repairs.[6] Myofunctional therapy establishes a good swallowing pattern by strengthening the muscles of the tongue and palate and lips. This therapy also trains the position of the tongue so that it is on the palate when it is resting, and trains the position of the lips so that it is closed when it is resting. This muscle therapy increases the stability of treatment and reduces the possibility of relapse.[7]

Figure 4. Extraoral photograph after treatment

Figure 5. Intra-oral photos after treatment

Figure 6. Cephalometric and OPG before treatment

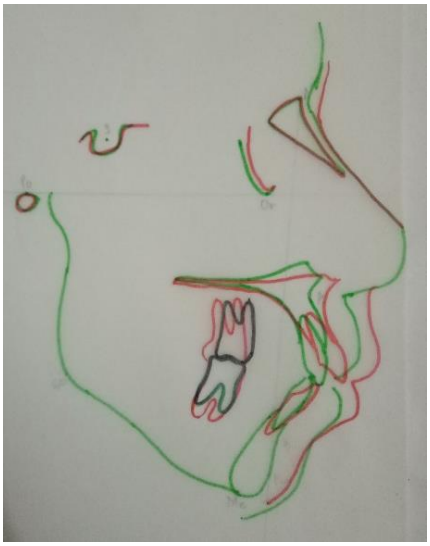

Figure 7. Lateral cephalogram superimpose results

CONCLUSION

Fixed orthodontic treatment for anterior open bite correction has shown satisfactory results. The stability of this treatment is assisted by tongue and soft palate therapy so that it can eliminate the bad habit of tongue thrusting and form a good swallowing pattern. Suggestions, tongue and soft palate therapy as well as good swallowing patterns still have to be done with more practice.

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